

DRAWINGS ATTACHED



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(54) SHIPS HAVING PROPULSION AND BALLASTING TUNNELS

(71) I, REUBEN MURPHY GAINSLEY, known as REUBEN MURPHY G., of 9 Clifford Street, London, W.1. (formerly of 45 Matlock Court, Kensington Park Road, London, W.2), a citizen of the United States of America, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to ocean going ships and other craft.

Provision of ducts or tunnels extending fore and aft of a ship's hull and having inlet or outlet openings located at the bow and stern is well known, such ducts incorporating an impeller to set up water flow in the required direction through the ducts for a jet propulsion.

I have now ascertained that by providing two or more ducts or tunnels at each side of the ship, in at least one of which tunnels there is incorporated propulsion means for propelling the ship astern or forwards, and utilising the other tunnels as a means of ballast control especially as applied to a plug-in barge, that it enables a greater control to be exercised on a ship especially when conditions are difficult as in a high wind when docking or as sometimes experienced in an estuary when operating against a fast tide or strong current.

According to the present invention, a ship comprises a hull having a double shell or formed of sections, one of which as a double shell, in which there are provided within the double shell and extending from bow to stern thereof at each side, two or more water tunnels, the lower tunnel or tunnels having water propulsion means, by which, when required, the ship can be propelled forwards or astern, or sideways, and the other or upper tunnel or tunnels having valve control gates so that in operation they can be opened to admit or evacuate water ballast,

and means for blowing the tunnels to evacuate the water.

The invention is diagrammatically illustrated in the accompanying drawings, in which:—

Figures 1 and 2 are respectively a side elevation and a transverse section of a vessel having twin shell plates provided with a series of tunnels.

Figure 3 is a detail view;

Figure 4 is a side elevation of a plug-in barge, the cargo or forward section of which is fitted with propulsion and ballast control tunnels in accordance with the invention, and

Figure 5 is a part plan view of the same.

Referring first to Figures 1—3 of the drawings, the hull of the vessel is constructed with inner and outer shell plates indicated respectively at 1 and 2, so as to provide from the bows to the stern compartments in which are accommodated ducts or so-called tunnels 3. Otherwise, the ship's construction may be standard including stern propeller(s) and steering gear. As shown in Figure 2, the hull has a double bottom 4 providing ballast tanks 5, 5¹. 6 is a longitudinal bulkhead extending from the bottom to deck level at 7, the deck 7 being provided with hatches 8 and derricks 10 (See Figure 4), if necessary, one being provided to each compartment in the hull.

The tunnels 3 are located below the Plimsoll line 11, each tunnel 3 being provided at its ends with gates which may take the form of hinged plates 12, so that any tunnel not in use may be closed against the ingress of sea water. The lowermost tunnel, or tunnels, at each side are operated as propulsion tunnels: thus each of the three lowermost tunnels is provided with an impeller or pump indicated at 13 in Figure 2, by which sea water can be drawn in at the bow inlet to enable the ship to be manoeuvred ahead, or by reversing the direction of flow to enable

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it to move astern (or sideways). By arranging for the drive to the impellers or pumps to be taken from a source of power other than the main engine by which the ship is propelled, it is clear that control of the propulsion water issuing from the tubes is independent of the ship's propeller which permits manoeuvring of the ship to be carried out even when the main engines are out of use. Moreover, by bringing the propulsion tunnels into operation any sudden swinging of the ship may be countered.

The upper or uppermost tunnels function solely as a means of controlling depth stabilisation of the hull by admitting sea water thereto so that the ship can be trimmed to the desired depth consistent with most effective conditions for speed and safety. Provision is made for evacuating the ballast control tunnels 16, for which purpose individual tunnels are connected to means by which water therein, having first closed the valves 12, can be blown out and thus speedily evacuated. In practice this may be done by means of compressors connected to reservoirs in which air is stored under pressure for blowing ballast tubes (as in a submarine), the water being discharged through non-return valves, e.g. of the Kingston type.

Referring now to Figures 4 and 5, the ballast control arrangement of this invention is shown adapted to a plug-in-barge which comprises a two-part hull including a forward cargo, or passenger carrying section 20 and a stern power unit 21 containing the propulsion machinery, steering gear and other equipment, by which the ship is normally propelled and steered. As can be seen from Figure 5, the forward section 20 is constructed with a central cavity 23 terminating at each side in stern extensions 24, 25 both the central cavity and stern extensions having shouldered portions 23¹, 24¹, 25¹ to provide vertical and transverse interlocks with correspondingly constructed mating parts of the stern unit 21.

To provide for a solid interlock when the stern unit 21 has been entered into its plug-in position, the mating surfaces are channelled to provide a ribbed formation, the ribs on one surface being formed or lined with baulks of timber or other compressible material, for example rubber, preferably mounted in the forward section 20. Provision is made for drawing the two sections

into tight contact and maintaining them in inter-engagement. In this embodiment the forward section 20 is constructed with a double skin as shown in Figure 2, housed within which are a series of four tunnels 30 extending from bow to stern at each side, the lowermost two of which incorporate propulsion means, while the two uppermost tunnels are used as a means of ballast control in the manner described.

WHAT I CLAIM IS:—

1. A ship comprising a hull having a double shell or formed of sections one of which has a double shell, in which there are provided within the double shell and extending from bow to stern thereof at each side, two or more water tunnels, the lower tunnel or tunnels having water propulsion means, by which, when required, the ship can be propelled forwards or astern, or sideways, and the other or upper tunnel or tunnels having valve control gates so that in operation they can be opened to admit or evacuate water ballast, and means for blowing the tunnels to evacuate the water.

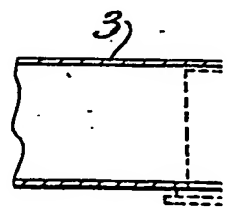
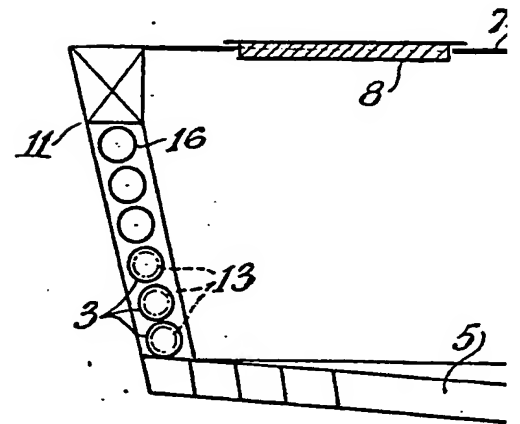
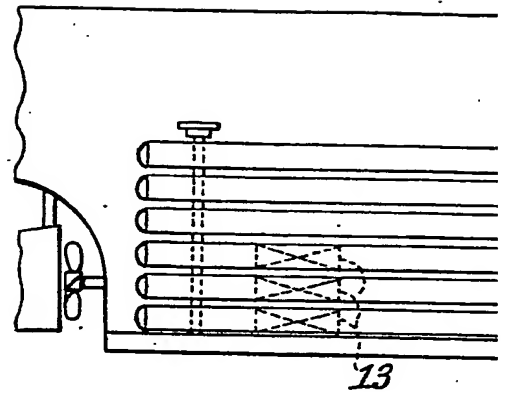
2. A ship as claimed in Claim 1, wherein the water propulsion means in the water tunnel is in addition to the normal ship's propellers.

3. A ship as claimed in claim 2 comprising a forward passenger carrying or cargo section and a stern section for plugging into the forward section, in which the water tunnels are provided in the forward section and the stern section is constructed as a power unit for normal propulsion.

4. A ship as claimed in any of claims 1 to 3 having two or more water ballast tunnels at each side and control means for controlling operation of the valve gates so that ballast water can be admitted or excluded from the tunnels in stages as required.

5. A ship comprising a hull having double shell plates and tunnels accommodated within the shell plates and extending from the bows to a point at or adjacent the stern substantially as described with reference to the accompanying drawings.

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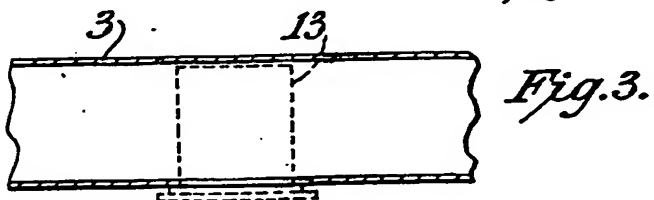
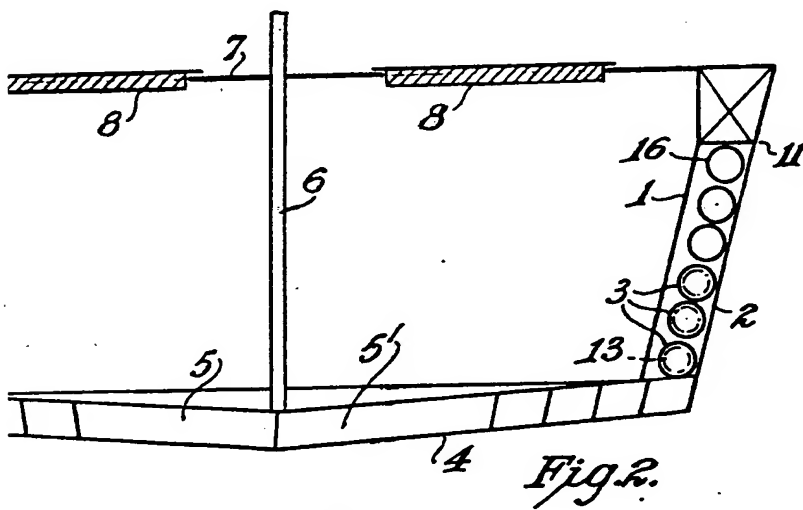
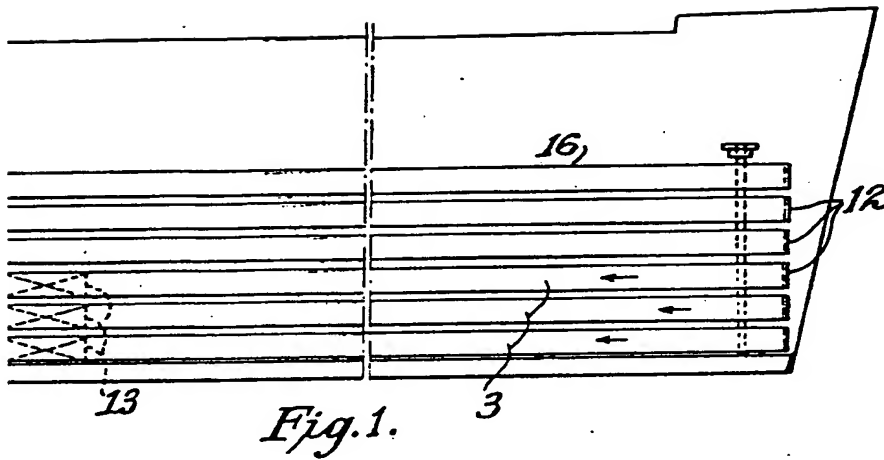
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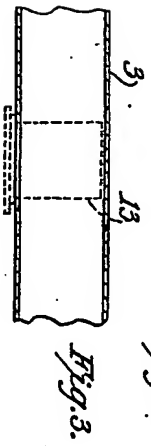
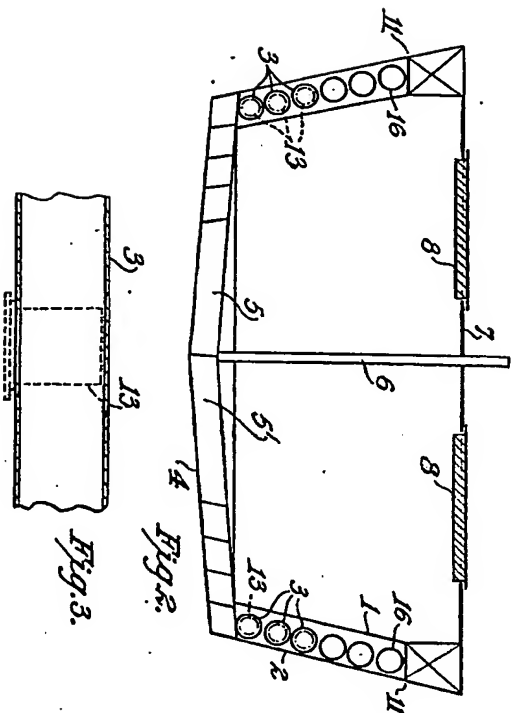
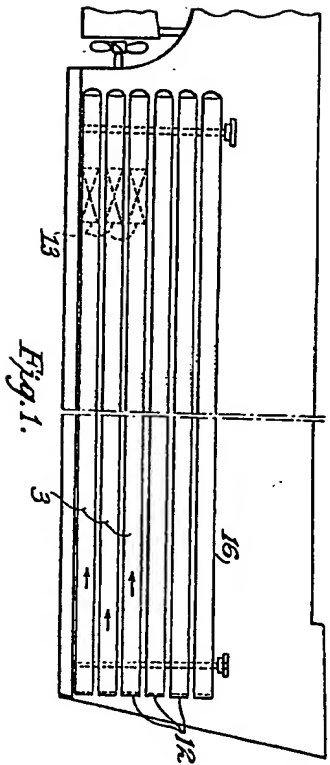
COMPLETE SPECIFICATION

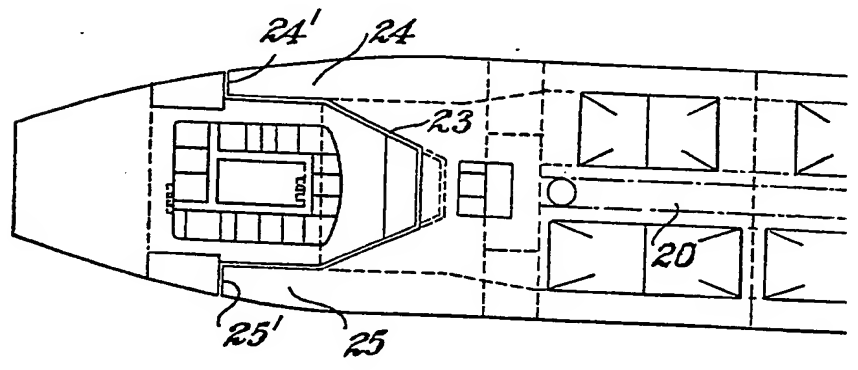
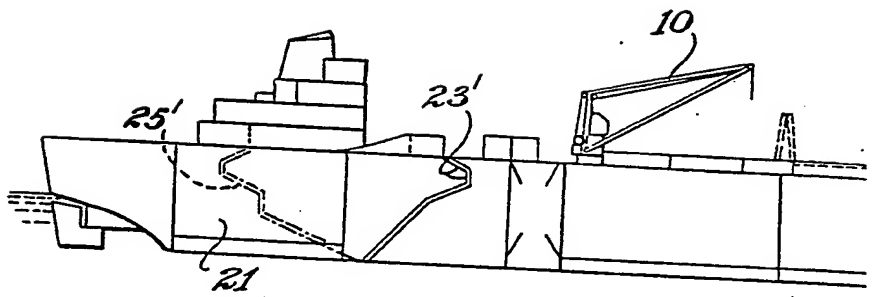
2 SHEETS

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Sheet 1







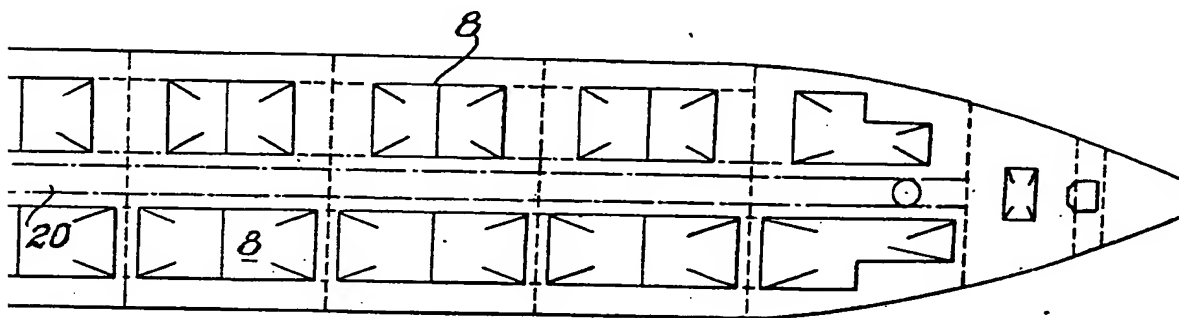
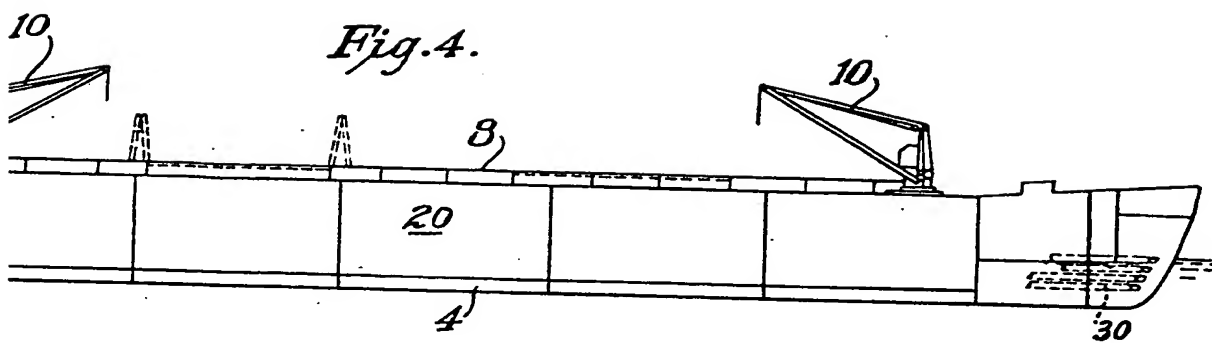


Fig.5.

